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Address: Dr J. P. Vande weghe, BP 931, Kigali, Rwanda.

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The relationships of the African warblers *Apalis binotata* and *A. (b.) personata*

by M. P. S. Irwin

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The Masked *Apalis binotata* Reichenow is generally accepted as being divisible into 3 races, 2 of which are well marked. A lowland form, *A. b. binotata*, occurs confluent in forest, in Cameroon, northern Angola and from western Uganda to the base of Mt Elgon and to northwestern Tanzania. It is replaced by *A. b. personata* Sharpe in the highlands of eastern Zaïre, from west of Lake Edward on the Lendu Plateau south to Mt Kabobo, the Nyungwe Forest in Rwanda and in southwestern Uganda on the Rwenzori Range, the Impenetrable Forest and Kigesi. Another less well marked form nearest to *personata*, *A. b. marungensis* Chapin, occurs above 1800 m in the Marungu Highlands in southeast Zaïre.

Lowland *binotata* and montane *personata* (with *marungensis*) differ considerably in colour and pattern of the head (Fig. 1); otherwise they are rather alike. They are also known to replace one another abruptly and without intergradation where their ranges meet, and the highland form is larger. Despite this, they are treated as conspecific by Chapin (1953), Schouteden (1954), Mackworth-Praed & Grant (1955), White (1962), Hall & Moreau (1970), Britton *et al.* (1980), Wolters (1980) and Traylor *in* Mayr & Cottrell (1986).



Figure 1. Head patterns of female Mountain Masked Apalis *Apalis personata* Sharpe (right) and female Masked Apalis *Apalis binotata* Reichenow (left). Scale 1/1.

During a recent visit to the British Museum (Natural History), Tring, I studied the material of *binotata* and *personata*. Hall & Moreau (1970) treat *binotata* as being closely related to the Yellow-breasted Apalis *A. flavida* (Strickland) and forming a species group with Rudd's Apalis *A. ruddi* Grant. However, while *binotata* gives the immediate impression of being a heavily melanised forest representative of *flavida*, *personata* does not and is more distinct. Compared with *personata*, nominate *binotata* has the black on the throat and breast more restricted, extending less towards the belly, and the centre of the belly whiter, less washed with grey, while the undertail-coverts are yellow and all the rectrices have conspicuous yellow tips. The most distinctive feature however, is the difference in head pattern; in *binotata* there is a white line separating the black chin and throat from the sides of the face to the ear-coverts, where there is a posterior grey patch. In *personata* the forehead and crown are black (slate grey in *binotata*) like the sides of the face and there is a somewhat triangular white patch behind the ear-coverts, bordered posteriorly with yellow. The undertail-coverts are off-white like the belly and the yellowish tips to the tail are restricted to the outer rectrices and may be absent. This varied combination of plumage characters and particularly the different arrangement of the white head and throat patterns, gives the 2 forms a very different appearance. These are well illustrated by Schouteden (1954, Figs 221, 222) and shown here in Fig. 1. In study skins the legs and feet of *binotata* are a deep green colour, much darker than in *personata*. In West Africa Bannerman (1939) for *binotata* states flesh-coloured legs, and Friedmann & Williams (1969) for Uganda give dark grey-brown, which more closely approaches the colour in skins. Chapin (1953) gives the feet of *personata* as brownish pink, washed with greyish on the metatarsus; Jackson & Sclater (1938) give the legs of *binotata* as bright brown and *personata* as dark flesh. Eye and bill colour are alike or almost so.

There are also marked size differences, montane *personata* being larger (mm, mean in brackets): *binotata* (12 ♂♂, 8 ♀♀)—wing, ♂♂ 47–52 (49), ♀♀ 45–48 (46); tail, ♂♂ 38–45 (40), ♀♀ 33–37 (35); *personata* (9 ♂♂, 6 ♀♀)—wing, ♂♂ 55–58 (56), ♀♀ 53–56 (54); tail, ♂♂ 42–48 (46), ♀♀ 41–45 (43). The bill in *personata* is noticeably longer, 12.5–14.5 (13.1) mm against 12.0–13.5 (12.6) mm in *binotata*; the bill of *personata* is also somewhat broader, especially at the gape, and is flycatcher-like. Friedmann & Williams (1969) give the weight of *binotata* as 7–9 g, but no weights for *personata* appear to have been published.

No intermediates are known between *binotata* and *personata* where their respective ranges meet and they appear parapatric with altitudinal separation. Friedmann (1966) remarked that it was difficult to visualise the geographic ranges of the 2 forms in the area where they meet. Britton *et al.* (1980) provide the distribution of *binotata* as between 1200 and 1500 m in the Kibale and Malabingambo forests, with *personata* at 1500–2800 m in the Impenetrable Forest and on the Rwenzori Range. Chapin (1953) provides a clearer picture of altitudinal replacement; he obtained *personata* on west Ruwenzori (= Rwenzori) at 6000 ft (1800 m) at the headwaters of the Mpanga river just before it issues from the mountains, yet at 5000 ft (1525 m) along the same stream, in the Mpanga (= Kibale) Forest, it is replaced by *binotata*, which was very common there. This observation is qualified by the remark that the country in-between is open and grassy, but it seems unlikely that this would constitute a barrier.

There seems no good reason for continuing to regard *binotata* and *personata* as conspecific and they must be considered to have diverged sufficiently to be treated as full species, replacing one another where their ranges adjoin. The differences separating them are greater than would normally be expected between conspecifics. Even if they were not in contact there would still be ample grounds for regarding them as full species purely on morphological differences.

Specimens of the race *marungensis* from the Marungu Plateau were not available for examination, but as it possesses the same head pattern as *personata* it is clearly a race of that species. It differs from nominate *personata* principally by having the sides of the breast greener (Dowsett & Prigogine 1974), more greyish-black on the sides of the face and the black on the foreneck bordered with grey; it is also long-winged, 53–57.5 mm (Chapin 1953).

Some discussion of possible isolating mechanisms within this group is appropriate. Lewis (1982a) has described the threat display of the closely related *A. flavida* where the prominent white throat patch is shown off. The throat patch is also considered to be of importance in recognition between individuals and is used during semi-automatic display while duetting. A strong pair-bond is also maintained throughout the year (Lewis 1982b). *A. personata* is also known to duet (Kunkel 1974) and *binotata* will almost certainly be found to do so. Facial and threat patterns are apparently important in species recognition in *Apalis*. The face-patterns that distinguish *binotata* from *personata* would almost certainly be sufficient to act as specific isolating mechanisms. Behaviourally all the members of this species group are likely to be very similar and the early establishment and maintenance of a permanent pair-bond would reinforce any isolation between populations.

It is also evident from the close similarity between *binotata* and *flavida* that they are descended from an immediate common ancestor and can be regarded as members of a superspecies. However, as *personata* shares fewer characters, is more distant and therefore derived, it cannot bear a similar relationship to *flavida*, though all 3 are phyletically close and have a shared common ancestry. As they do not bear an equal relationship to *flavida*, it is inconsistent to treat *binotata* and *personata* as forming a superspecies, or to go as far as to include all 3 in this category. On present

evidence, *personata* may have diverged earlier from *flavida* stock and before *binotata* became differentiated. The heavy melanisation of the plumage in the 2 species may have occurred independently in response to adaptation from a savanna to a forest environment and as different chronological events.

In my view *A. binotata* is a monotypic species of lowland forest, quite closely related to the widespread and highly polytypic *A. flavida* of savanna; but the more distinct, highland, *A. personata*, is a separate species with 2 races, *A. p. personata* Sharpe and *A. p. marungensis* Chapin.

It is hoped that as a result of this paper more attention will be paid to these 2 species where their ranges adjoin. D. A. Turner (*in litt.*) informs me that *personata* in the Nyungwe Forest will immediately respond to a play-back of a recording of *binotata* from the Mpanga Forest. However, as the calls of closely related *Apalis* species tend to be very similar, too much weight need not be put on this and differences in facial patterns may prove to be more fundamental.

As the common name of the Masked Apalis is now applicable to 2 species, it would seem appropriate to restrict its use to *A. binotata* and that the name Mountain Masked Apalis be used for *A. personata*.

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Address: M. P. S. Irwin, 3 Whitecairns Avenue, Hillside, Bulawayo, Zimbabwe.